Naval Sea Systems Command

NAVAL SURFACE WARFARE CENTER

CWES

Coastal Warfare Evaluation Systems

NSWC

COASTAL SYSTEMS STATION

Mission

To provide end-to-end simulation that meets analysis, training, and acquisition needs for the expeditionary warfare (EXWAR) community, including mine countermeasures (MCM), minefield operations and planning, and EXWAR amphibious assault.

Simulation Development

Coastal Systems Station (CSS) develops, implements, and exercises simulations for the purposes of analysis, training, and assessment. CSS incorporates

- Object-oriented architectures,
- Command and control structure,
- Multifidelity model implementation, and
- Distributed communication technology

that adhere to High Level Architecture (HLA) philosophies for simulation development. CSS currently develops simulation products for the Naval Mine Warfare Simulation (NMWS) and supports simulation development for the Joint Countermine Operational Simulation (JCOS), Naval Simulation System (NSS), Joint Simulation System (JSIMS), Joint Warfare Simulation System (JWARS), and Joint Modeling and Simulation System (JMASS). CSS also houses the Joint Theater Level Simulation (JTLS), Interactive Theater Engagement Model (ITEM), and General Campaign Analysis Model (GCAM) to conduct high level analyses.

Simulation-Based Analysis

Simulation-based analysis combines model development, simulation development, and visualization to provide useful products, information, and services to the Fleet and acquisition communities. Analysis personnel use their expertise in EXWAR and mine warfare (MIW) to perform:

- Scenario/threat/force laydown generation
- Parametric factor sensitivity analysis
- Tactics evaluation and generation
- Requirements definition
- System/concept payoff evaluation

System Performance Simulation And Model Development

The system performance simulation and modeling group enhances the fidelity of systems performance data. Examples of performance data include interactions between mine and sweep, mine and ship, mine and minehunting, mine and mine neutralization, platform and environment, and MCM system and environment. Off-line programs are used to generate environmentally sensitive multidimensional performance tables to provide higher fidelity to the JCOS and NMWS programs. The performance simulations and models used to compute these high-fidelity tables use high-speed servers to provide "in-line" solutions, based on the HLA philosophy. CSS also uses a real-time hardware-in-the-loop simulation facility, the Multi-Warfare Systems Evaluator (MWSE), to directly simulate developmental, tactical, or threat hardware, therefore providing detailed analysis of the effects of the environment, tactics, and operation on the system's performance.

Database Development

The database technology group provides flexible, cost-effective database systems that possess inherent data error elimination methods and mechanisms that ensure a sound multiuser secure environment. Staff members are highly skilled in applying conventional commercial database management system technologies used in industry and government applications, including relational database management systems (RDBMSs) and object-oriented database management systems (OODBMSs). The database products support models, simulations, decision support systems (DSSs), group DSSs, geographic information systems (GISs), executive information systems (EISs), and expert systems (ESs).

Visualization

The visualization group provides efficient visualization solutions for both external and internal customers. This group maintains a diverse array of visualization resources and tools. The staff is highly trained and proficient in developing in-house products as well as integrating and using commercial off-the-shelf visualization tools. The expertise of the visualization group is enhanced with access to the latest high-end computer hardware resources and software tools. The visualization products support a variety of communication protocols, 3-D object models, 2-D and 3-D output displays, satellite imagery overlays, environmental databases, and animation, compact disk recording, video recording, and editing capabilities. From sophisticated 3-D terrain imagery fly-through products to concept visualization demonstrations and conventional Joint Maritime Command Information System (JMCIS) tactical displays, CSS has the resources to meet the requirements for any program.

NAVAL SEA SYSTEMS COMMAND
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NSWCDD/MP-97/61

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